

REMARKS

In the Office Action of March 31, 2003, Claims 1 - 3 were rejected. No claim was allowed. In response, Claims 1 - 2 are amended. Reexamination and reconsideration are respectfully requested in view of the foregoing amendments and the following remarks.

Rejection of Claims 1 - 3 under 35 U.S.C. 112, second paragraph and 35 U.S.C.

101

Claims 1 - 3 were rejected under 35 U.S.C. 112, second paragraph and 35 U.S.C. 101 on the alleged grounds that the claims include a processing apparatus and a method of using the apparatus. The Examiner alleges that the claims are ambiguous and embrace and overlap two different statutory classes of invention.

In response, Claim 1 is amended to rephrase the limitations of the claim so that it is clear that they are limitations to the apparatus. In particular, components of the apparatus are described as capable of performing the described method steps, so that the descriptions of method steps serve to further define the apparatus.

Accordingly, it is respectfully submitted that the rejections under 35 U.S.C. 112, second paragraph and 35 U.S.C. 101 are thereby overcome.

Rejection of Claim 1 under 35 U.S.C. §102(b) over Komino

Claim 1 was rejected under 35 U.S.C. §102(b) as anticipated by Komino (U.S. Patent No. 5,769,952). The Examiner alleges that Komino teaches an apparatus for processing a specimen comprising an etching process unit that is supplied with a gas to produce a plasma, a rinsing unit and a dryer unit for drying the exposed

surface. With respect to the limitations in Claim 1 drawn to an intended method to be performed using the claimed apparatus, the Examiner alleges that the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim.

This rejection is traversed. In particular, independent Claim 1 specifies that the processing apparatus is dedicated for processing a specimen having a plurality of layers at least one of which includes NiFe or NiFeCo alloy which has the characteristic of having magnetic properties that deteriorate if the specimen is heated above 230 °C. The etching process unit of the present invention therefore is defined as being capable of etching of the specimen under a low specimen temperature of below 200 °C by making use of a high density gas plasma with a low ion energy.

Further, the etching process unit, the rinsing unit and the dryer unit are arranged in a unitary apparatus to allow immediate successive treatments therebetween as, for example, explained on page 5, line 15 through page 8, line 13 of the specification and in particular, on page 7, line 26 through page 8, line 13. In particular, the apparatus is arranged so that removal of the corrosive materials deposited or remaining on the etched surface of the specimen can be achieved by ~~the rinsing unit immediately after the etching without requiring conventional baking~~ processes for removing residual chlorine, since conventional baking may deteriorate the magnetic property of the specimen. Further, the apparatus is arranged so that drying can be performed at a temperature of below 200 °C immediately after the rinsing.

Komino does not disclose that its apparatus is capable of performing etching or drying at a temperature of below 200 °C. Further, Komino does not disclose that its processing apparatus is capable of processing a specimen that has magnetic properties that deteriorate at a temperature above 230 °C, so that an apparatus that performs etching and drying at a temperature of below 200 °C is necessary and, in particular, does not disclose that its apparatus is capable of processing a specimen having a plurality of layers at least one of which includes NiFe or NiFeCo alloy.

Accordingly, it is respectfully submitted that the Claim 1 is not anticipated by Komino.

Rejection of Claims 2 and 3 under 35 U.S.C. §103(a) over Komino in view of Kondo and Kameyama

Claims 2 and 3 were rejected under 35 U.S.C. §103(a) as obvious over by Komino in view of Kondo (U.S. Patent No. 5,303,671) and Kameyama (JP 60-183996). The Examiner alleges that in addition to what is described above, Komino discloses an atmospheric loader, a vacuum transport chamber having a vacuum transport robot, unload and loadlock chambers connecting between the atmospheric loader and the vacuum transport chamber for delivering the specimen, wherein the vacuum transport chamber is connected to the etching process chamber of the apparatus and the atmospheric loader is connected to the rinsing unit and drying unit. Regarding Claim 3, the Examiner alleges that Komino teaches that any number of the three processing units 10A - 10C may be etching chambers. The Examiner acknowledges that Komino does not teach a rinsing cup in the rinsing unit and a hot plate in the drying unit. The Examiner alleges that Kondo teaches the use of a hot

plate for the purpose of heating a specimen after washing. The Examiner takes the position that it would have been obvious to have provided a hot plate in the drying unit of Komino in order to heat a specimen after washing as taught by Komino. The Examiner further alleges that Kameyama teaches the use of a rinsing cup for the purpose of reducing the adhesion of dust, to use only a small amount of a treating liquid and to equalize the extent of a treatment. The Examiner alleges that it would have been obvious to have provided a rinsing cup in the rinsing unit of Komino in order to reduce the adhesion of dust, use only a small amount of treating liquid and equalize the extent of the treatment as taught by Kameyama.

This rejection is respectfully traversed As discussed above, independent Claim 1 specifies that the processing apparatus is dedicated for processing a specimen having a plurality of layers at least one of which includes NiFe or NiFeCo alloy which has the characteristic of having magnetic properties that deteriorate if the specimen is heated above 230 °C. The etching process unit of the present invention therefore is defined as being capable of etching of the specimen under a low specimen temperature of below 200 °C by making use of a high density gas plasma with a low ion energy.

Komino, Kondo and Kameyama do not disclose that their apparatus are capable of performing etching or drying at a temperature of below 200 °C. Further, these references do not disclose that their processing apparatus are capable of processing a specimen that has magnetic properties that deteriorate at a temperature above 230 °C, so that an apparatus that performs etching and drying at a temperature of below 200 °C is necessary and, in particular, does not disclose that its apparatus is capable of processing a specimen having a plurality of layers at least

one of which includes NiFe or NiFeCo alloy.

Accordingly, it is respectfully submitted that Claims 2 and 3 would not have been obvious over Komino, Kondo or Kameyama, alone or in combination.

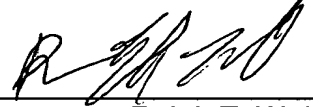
Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that Claims 1 - 3 are in condition for allowance. Favorable reconsideration is respectfully requested.

Should the Examiner believe that anything further is necessary to place this application in condition for allowance, the Examiner is requested to contact applicants' undersigned attorney at the telephone number listed below.

Kindly charge any additional fees due, or credit overpayment of fees, to Deposit Account No. 01-2135 (503.38156VX1).

Respectfully submitted,
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IN THE CLAIMS

1. (twice amended) An apparatus ~~for~~ capable of processing a specimen having two or more layers, at least one of which includes NiFe or NiFeCo alloy, the magnetic property of which is deteriorated if the specimen is heated above 230 °C, and which is laminated on a substrate, the apparatus comprising:

an etching process unit, which is supplied with a gas that ~~produces~~ can produce a high density gas plasma of a low ion energy with the gas and ~~performs~~ which can perform etching of the specimen laminated on the substrate, with the produced high density plasma gas ~~under a~~ while controlling the temperature of the specimen below 200°C;

a rinsing unit ~~which performs~~ that can perform rinsing with a liquid of an exposed surface by the etching of the lamination layer including the NiFe or NiFeCo alloy, ~~using a liquid~~ so as to wash out substantial corrosive elements on the exposed surface, immediately after the etching; and

a dryer unit ~~which performs~~ that can perform drying of the rinsed surface of the lamination layer including the NiFe or NiFeCo alloy immediately after the rinsing thereof, wherein said etching process unit ~~can further performs perform~~ in succession etching of the dried surface of the lamination layer including the NiFe or NiFeCo alloy with a high density gas plasma of a low ion energy ~~under a~~ while controlling the temperature of the specimen below 200 °C.

2. (twice amended) An apparatus for processing a specimen according to claim 1, further comprising:

an atmospheric loader of the specimen laminated on the substrate;

a vacuum transport unit having a vacuum transport robot therein; and

unload and load lock chambers connecting between said atmospheric loader and said vacuum transport ~~chamber~~ unit for delivering the specimen via an atmospheric transport unit, wherein

said vacuum transport ~~chamber~~ unit is connected to an etching process chamber of said etching process unit, and

said atmospheric loader is connected via said atmospheric transport unit to at least a rinsing cup and hot plate provided in said ~~rinsing/dryer~~ rinsing and dryer units.